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ABSTRACT

The purpose of this study was to determine if beginning readers read with fewer errors when the reading materials had content directly related to the reader's existing cognitive structure (for example, reading based on recent concrete experiences). Meaningfulness was manipulated by basing the reading materials on an audio-tutorial science program in which 54 children participated, with 18 each at basal reading levels one, two, and three. Pretests and posttests consisted of the subjects reading two content passages at their reading levels while the researchers recorded errors of substitution, addition, mispronunciation, ommission, and repetition. Results indicated that the beginning readers read with 25% fewer errors when the content was meaningfully related to recent concrete experiences. (Author/RL)

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Facilitating Beginning Reading With the Use of Meaningful Content

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The purpose of this study is to determine if beginning readers read with fewer errors if the reading materials have content directly related to the reader's existing cognitive structure (i.e. reading based on recent concrete experiences). Fifty-four children, 18 each at basal reading levels one, two and three, were given meaningful reading materials. Meaningfulness was manipulated by basing the reading materials on an audio-tutorial science program. Results indicate that the beginning readers read with 25 percent fewer errors when the content was meaningfully related to recent concrete experiences. Such results are taken as strong support for the feasability of using experienced-based reading materials to facilitate the teaching of beginning reading.

A current conceptualization of reading is that it is an active process of directly reconstructing meaning from semantic and syntactic cues as well as graphic information (Goodman, 1968, 1973; Goodman & Niles, 1970; Lefevre, 1969; Smith, 1971, 1973; Smith, Goodman & Meredith, 1970; Weber, 1968). An important issue concerning this definition is the relative importance of semantic and syntactic cues as opposed to the graphic information on the printed page. For example, Smith (1971) maintains that, in reading, the information that passes from the brain to the eye is much more important than the information transmitted from the eye to the brain; that is, the information which guides the reader's eye movement comes mostly from cues other than visual ones. These other cues derive from the reader's prior experience and involve the reader's knowledge of the language and of the content of the material being read.

Acceptance of Smith's emphasis on semantic and syntactic information requires the rejection of a more traditional definition of reading which totally relies on such processes as "word recognition," "sounding out" or "word attack." Instead, as Smith (1971, 1973) and earlier Hollingworth (Anderson & Dearborn, 1952) state, fluent reading can be regarded as the reduction of uncertainty. The skilled reader selects the fewest cues possible for reconstructing the meaning, or in other words, for reducing his uncertainty as to the correctness of the meaning he is reconstructing.

A relatively fluent reader does not use all of the information available to him and it is the hypothesis of several authors

(Emans, 1969; Goodman, 1973; Huey, 1968; Smith, 1971, 1973; Weber, 1968) that the more syntactic and semantic information available, the less visual information that is needed. This hypothesis is supported by a study by Tulving and Gold (1963) in which words presented in sentence context were perceived much more rapidly than words presented in isolation. Less visual information was required to identify words given semantic and syntactic information from the context.

In general, the processes involved in reading that have been described are attributed only to the fluent reader. Almost all authors of reading theory make a distinction between beginning reading and skilled reading (e.g. Anderson & Dearborn, 1952; Chall, 1967; Smith, 1971, 1973). It is clear that there is a difference between the performance of beginning and fluent readers. But this does not imply that beginning readers are not capable of the same processes that have been suggested for fluent readers. There have been some interesting research results which question the often-emphasized distinction of the processes involved in beginning and fluent reading. For example, Goodman (1965) has reported evidence that primary readers read words less accurately when they appear in list form rather than story form. In another study, Goodman (1967) found that self corrections in oral reading often occur when the meaning or syntax of a passage is disturbed. Both of these studies show that the beginning reader, like the fluent reader, can use semantic and syntactic information.

It may be possible to facilitate the beginning reader's use of semantic cues by basing children's reading material on recent experiences. This notion of integrating current learning, whether it be from reading or other experiences, with past experiences is supported by several cognitive theorists (e.g. Anderson & Ausubel, 1965; Ausubel, 1962a, 1962b, 1968; Flavell, 1963; Piaget, 1952, 1954, 1967). According to Ausubel, the verbal material itself is only potentially meaningful. Meaningful learning occurs when the potentially meaningful material is related in a substantive fashion to what the learner already knows (Ausubel, 1962a).

The hypothesis of this study is that if reading materials are meaningfully related to the beginning reader's concrete experiences, he will be able to use semantic cues in addition to syntactic and graphic cues. This should allow the child to read with greater efficiency (i.e. fewer errors).

Method

Subjects. The beginning readers were drawn from an Ithaca, N.Y. elementary school. Fifty-four primary (grades 1-3) children were used. Eighteen were selected from each of three basal reading levels (grades 1, 2, 3).

Elementary Science Program. The Elementary Science Program (ESP) (Postlethwait, Novak & Murry, 1972, pp. 110-130) was the source of meaningful learning and therefore acts as the independent variable for this experiment. The ESP is an audio-tutorial, ele-

mentary program that includes lesson sequences on various areas of science. Children using the program manipulate and observe science materials under the guidance of a taped program. All of the children worked on Level 1 of the program and began with the first two introductory lessons.

Procedure. Initially a reading pretest was given. The materials used for the reading pretest were passages written by the first author based on the information in two different series of lessons of the ESP (energy and molecules). Passages were written on three grade levels of reading difficulty according to McCracken's (1970) specifications. For the pretest, the subjects were asked to read the two content passages on their reading level (e.g. 3^1 and 3^2 basal levels read level 3 passages).

Each child read the two passages aloud. The order in which the passages were read was randomized to eliminate any order effect. Oral reading errors were recorded on a duplicate sheet of the passage being read. The following types of errors were recorded:

1. substitution--saying a word different from the one in the passage
2. addition--inserting a word
3. mispronunciation--this was scored when the pronunciation was such that the child could not tell what the word was
4. omission--skipping a word and continuing to read
5. repetition

6. stop--recorded when child unable or unwilling to make an attempt at decoding a word

After the pretesting was completed, the beginning readers were matched within level on the number of reading errors made. Because the two passages were not of equal length or the same difficulty level, the children were matched on the two passages separately rather than on a total error score or an average error score. For example, if subject 1 had an error score of 24 for the molecules passage and 12 for the energy passage, he would be better matched with subject 2 who had the same pattern of errors for the two passages (molecules errors = 21, energy errors = 10) than with subject 3 who had the same average error score, but a very different pattern (molecules errors = 16, energy errors = 17).

After matching, one member of each pair was randomly assigned to go through the sequence of ESP lessons covering the topic of molecules (lessons 19-22, 24), while the other member was assigned to receive the sequence of ESP lessons covering the topic of energy (lessons 3-7). There were five lessons used for each topic. Each lesson averaged 15-20 minutes in length. One lesson was covered per week and it took approximately 5 weeks for the content material to be covered; but the total time of instruction for each subject amounted to no more than 100 minutes during that period.

When the lessons were completed a reading posttest was given. The posttest consisted of having each child read again the same two passages he had read as a pretest. Thus, each subject acts as

both an experimental and control subject. Because one group has established a meaningful cognitive base of the energy concepts studied under the energy treatment, they should find it easier than their matched pairs to read the energy passage on the posttest. A comparable effect is expected for the second group, but on the molecules passage.

Results

The question of primary importance to this study was whether beginning readers read with fewer errors when the material being read has a meaningful content than when the material is not related to the child's cognitive experiences. To test this hypothesis a three factor, matched subjects ANOVA was performed on the error scores. (Kirk, 1968, pp. 246-251). The factors were: level (1, 2, and 3), treatment group (molecules lesson, energy lesson), and passage (energy, molecules).

The posttest error means for the treatment groups on the two passages are shown in Table 1.

Insert Table 1 about here

Inspection of Table 1 indicates a strong treatment by passage interaction; thus, confirming the hypothesis. In other words, subjects who had the energy treatment read the energy passage with fewer errors, and the subjects who had the molecules treatment read the molecules passage with fewer errors. In total, when the

content was meaningfully related to recent cognitive experiences, beginning readers read with 25 percent fewer errors. The ANOVA indicated that the treatment by passage interaction was statistically significant, F (1,24) = 15.62, $p < .001$). Except for a significant but irrelevant level by passage interaction, F (2, 24) = 4.21, $p < .05$, none of the remaining statistical comparisons were significant.

Discussion

The results of this experiment demonstrate that by using material related to recent cognitive experiences, reading can be facilitated. This is further evidence that beginning readers use cues other than grapho-phonic cues when reading. This supports Smith's (1971, 1973) and Goodman's (1968, 1973) conceptualization of reading.

If the beginning reader uses semantic and syntactic information, then it follows that the reading material should not be linguistically unnatural or overly simplistic. But this is not the case. The content of primary reading material has been criticized by many authors. As early as 1908, Huey argued that the content in primary readers was inane and disjointed (Huey, 1968). More recently, Smith (1973) has observed that primers often lack natural language and relevant subject matter; the providing little information for intelligent guessing. Goodman and Niles (1970) express a similar viewpoint.

The rationale for this type of material seems to lie in the type of instruction being used. Because the emphasis of reading instruction is on single words or word parts, this overly-simplistic material seems appropriate. But the limitations and even drawbacks of word recognition and particularly phonics instruction are enumerated in detail by many authors who support the definition of reading as a constructive process utilizing not just grapho-phonic information, but all the cues inherent in the language and available to the reader.

Presently, one method of teaching reading avoids the criticisms mentioned in this report. It is the Language Experience approach. The basic technique of this approach is for the teacher to initially have the child tell a story based on some experience or idea. The teacher then writes the story and the child reads it. The content of these stories naturally involves concepts within the scope of the child's knowledge and experience. This reading approach recognizes the child's need for learning to be based on experience, and, consequently, lessens the usual gap between the child's existing cognitive structure and the content of the story.

In light of the results of this study, there may no longer be the need to make reading instruction a completely separate process from the other more content-based learning experiences occurring in primary classrooms. Reading content-based materials (social studies, science, etc.) could contribute to the beginning reader's

reading development while serving other curricular ends.

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Footnote

This report is based on research conducted in partial fulfillment of the first author's Master's degree in Educational Psychology at Cornell University. The first author is now at California Regional Resource Center, 600 Commonwealth, Los Angeles, 90005 and the second author is at the Department of Educational Psychology, WPH 600, University of Southern California, Los Angeles, California, 90007. Requests for reprints should be sent to the first author. The authors acknowledge the assistance of Dr. J. D. Novak and Dr. M. D. Glock at Cornell University, and K. Woodward, J. Dembitsky, M. Bauer, J. Barney, S. McClelland, and C. Freeman at Fall Creek Elementary School, Ithaca, New York. An abbreviated version of this study will appear in the Journal of Reading Behavior.

Table 1

Posttest Error Means by Treatment Group and Passage

	Energy Passage	Molecules Passage
ESP Energy Lessons	8.63	12.07
ESP Molecules Lessons	11.85	9.37